

REMARKS

A. Previous Amendments to the Specification

Applicants respectfully acknowledge that the amendments to the specification, previously submitted in Amendment B, were sufficient to overcome the objection to the disclosure and to meet the requirements in order to receive the benefit under 35 U.S.C. §120.

B. Effective Filing Date

The statements related to the effective filing dates of the pending claims are acknowledged. These dates will be addressed below, to the extent necessary to respond to the rejections raised in this Office action. However, Applicants respectfully reserve the right to further address these dates, as necessary, at a later time.

C. Interview Summary

Applicants thank the Examiner for the courtesy of an interview with Applicants' representative, Paul A. Stone, on October 28, 2003, during which the currently pending claims, the prior art of record, and the outstanding Office action were discussed. The following is a summary of what is understood to be the issues discussed and agreed upon:

1. During the interview the Examiner indicated that the outstanding rejection under 35 U.S.C. §103(a) based on U.S. Publication No. 2001/0007352 would be withdrawn.
2. With regard to the outstanding rejection under 35 U.S.C. §112, 2nd paragraph, Applicants indicated that they would provide clarifying amendments and/or explanations to obviate this basis for rejection.
3. With regard to the outstanding rejection under 35 U.S.C. §112, 1st paragraph (enablement), Applicants indicated that they would provide remarks indicating that the invention defined by claim 1 is fully enabled

without reciting particular ranges, because the relative amount Europium is not critical to practicing the invention defined by claim 1. The Examiner indicated that such statements would obviate this basis for rejection.

4. With regard to the outstanding rejection under 35 U.S.C. §102(b) over Pedrero et al., Applicants explained why the subject matter of claim 1 would not have been inherently disclosed by this reference. Applicants agreed to include such explanation in their response to the outstanding Office action. The Examiner indicated that such an explanation would obviate this basis for rejection.
5. With regard to the remaining rejections under 35 U.S.C. §103(a) over one of U.S. Patent Nos. 6,479,835, 6,512,240, 6,528,812, 6,501,088, 6,495,850, Applicants will file copies of declarations clarifying inventorship of the inventions described and claimed in such patents and demonstrating that the disclosure in such patents did not constitute the work "of another." The Examiner indicated that such declarations would obviate this basis for rejection.
6. With regard to the double patenting rejections over one of U.S. Patent Nos. 6,479,835, 6,512,240, 6,528,812, 6,501,088, 6,495,850, Applicants indicated that additional assignment documents reflecting the ownership of the inventions defined by the claims of these patents are being prepared, and that Applicants intend to file a terminal disclaimer once the assignment documents are executed. The Examiner indicated that such a terminal disclaimer would obviate this basis for rejection.

D. Status of the Claims

In this Amendment C, claims 18 and 21 have been amended for purposes of clarification only, without change in the substantive scope thereof. More specifically, claim 21 has been amended to correct simple typographical errors, while claim 18 has been amended to correct a typographical error made in previously submitted

Amendment B, the claim now depending from claim 17 which is consistent with the text on page 6 of Amendment B.¹

Accordingly, claims 1-18 and 20-34 are currently pending.

E. 35 U.S.C. §112, Second Paragraph (Vague/Indefinite)

Applicants respectfully acknowledge that the rejection of claim 20 under 35 U.S.C. §112, second paragraph has been withdrawn.

In view of the amendment to claim 18 presented herein, Applicants respectfully request reconsideration of the rejection of this claim under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. As amended, claim 18 now depends from claim 17, as suggested in the present Office action (see, e.g., page 3, paragraph 2 therein).

Accordingly, Applicants respectfully submit claim 18 now satisfies the requirements of 35 U.S.C. §112, second paragraph. Withdrawal of this rejection is therefore requested.

Applicants further request reconsideration of the rejection of claims 4-6 and 10-12 under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Contrary to the Office's assertion, Applicants respectfully submit these claims do properly depend from claim 1. Specifically, it appears the Office has inadvertently confused the identifier "X" with the identifier "X'" (i.e., *X-prime*). As noted correctly by the Office, claim 1 does define X as Br or a combination of Br and Cl. However, claim 1 also defines X' in line 4 thereof as being selected from the group consisting of F, Cl, Br, I and combinations thereof. Claims 4-6 and 10-12, which depend directly or indirectly from claim 1, further specify that X', not X, be a member selected from the group consisting of Cl and Br.

¹ See page 6 of Amendment B, wherein under heading D it is stated that "[c]laim 18 has been amended to depend from claim 17"

Accordingly, Applicants respectfully submit these claims clearly satisfy the requirements of 35 U.S.C. §112, second paragraph. Withdrawal of this rejection is therefore requested.

F. 35 U.S.C. §112, First Paragraph (Enablement)

Applicants respectfully acknowledge that the rejection of claims 17, 18 and 20 under 35 U.S.C. §112, first paragraph has been withdrawn (per page 2, first paragraph of the present Office action).

Reconsideration is respectfully requested of the rejection of claims 1, 4-7, 10-13 and 21-24 under 35 U.S.C. §112, first paragraph, for containing subject matter which the Office asserts is not described in the specification in such a way as to enable one skilled in the art to make or use the invention commensurate in scope with these claims.²

1. Claims 1, 4-7, 10-13 and 21-24

The Office's rejection is based upon the assertion that "the specification, while being enabling for CsX phosphors containing 10^{-3} to 5 mol% of europium where X is Cl and/or Br, [and] the methods for forming [the] phosphor and binderless phosphor screen comprising this phosphor, does not reasonably provide enablement for CsX:Eu phosphors where X is Cl and/or Br and the amount of europium is undefined, [or] the methods for forming [the] phosphor and binderless phosphor screen comprising this phosphor."³

² Applicants will not specifically address claim 20, given that, as noted, the Office indicated on page 2 of the present action that the rejection of claim 20 under 35 U.S.C. §112, first paragraph had been withdrawn. Applicants therefore assume the reference to claim 20 in this rejection is a typographical error. However, should the inclusion of claim 20 in this rejection have been intended, Applicants respectfully submit it satisfies the requirements of 35 U.S.C. §112, first paragraph for the same reasons as those set forth for claims 1 and 4-6, from which it depends.

³ Quoting the present Office action at page 3 (see the first full paragraph related to this particular rejection).

In response to this rejection, and consistent with the above-noted Interview Summary, Applicants respectfully point out that the present application clearly indicates that the relative amount Europium is not critical to the practice of the invention as defined by claim 1. Specifically, on page 6, line 12 to line 17, of the present application, it is clearly stated that the concentration range for Europium of between 10^{-3} mol% and 5 mol% is simply *preferred*.

Accordingly, Applicants reiterate their position as set forth in Amendment B; that is, Applicants respectfully submit the Office has failed to establish a *prima facie* case of nonenablement with respect to the invention as defined by claims 1, 4-7, 10-13 and 21-24, given that (a) it has provided no evidence or reasoning to support its assertion that these claims contain subject matter which is not described in the specification in such a way as to enable one skilled in the art to make or use the invention commensurate in scope with these claims, and (b) it has failed to apply the standard for determining whether the specification meets the enablement requirement, which effectively requires the Office to provide evidence or reasoning that the experimentation needed to practice the invention as claimed is undue or unreasonable.

In view of the foregoing, Applicants respectfully submit this rejection is improper. Reconsideration is therefore requested.

2. *Claims 5, 6, 11 and 12*

In addition to the foregoing, Applicants would again point out that claims 5, 6, 11 and 12 depend directly or indirectly from claims 2 or 3. Claims 2 and 3 have not been rejected. Furthermore, claims 2 and 3 clearly include a concentration range for europium.

In view of the foregoing, reconsideration of this rejection is respectfully requested.

G. 35 U.S.C. §102 Rejection

Reconsideration is respectfully requested of the rejection of claim 21 under 35 U.S.C. §102(b) as being anticipated by Pedrero et al.

Claim 21 is directed to a phosphor characterized by the formula CsX:Eu , wherein X is selected from the group consisting of Br, Cl and combinations thereof, which exhibits a blue photoluminescence and a red photoluminescence when excited with radiation of 254 nm, wherein the blue photoluminescence has a power that is at least 100 times higher than the red photoluminescence. In contrast, Pedrero et al. only disclose the preparation of a CsCl:Eu phosphor, prepared by combining CsCl and EuCl_2 . Notably, Pedrero et al. fail to disclose, or make any reference to, a phosphor which exhibits the photoluminescence as claimed.

The Office appears to rely on an inherency theory for establishing its rejection of claim 21. As discussed below, however, such reliance is misplaced, because the synthesis protocols of Pedrero et al. reference do not necessarily result in the phosphor defined by claim 21. In fact, contrary to the Office's assertion, the claimed phosphor is distinguishable from that of Pedrero et al. because the difference in photoluminescence spectrum reflects a structural difference between the claimed phosphor versus the prior art. Accordingly, this difference in observed spectra unequivocally establishes that the phosphor of claim 21 differs from that disclosed by Pedrero et al.

Applicants further submit that the phosphor of claim 21 is not an inherent result of the methods taught by Pedrero et al. For example, Applicants disclose that phosphors having both blue and red emission peaks can be prepared, for example, by combining a cesium halide with Eu_2O_3 . Such phosphors are not necessarily obtained by the processes described by Pedrero et al., all of which clearly use divalent europium sources.

As noted previously in Amendment B, and again without being held to a particular theory, it is believed that an emission spectrum comprising both blue and red peaks may be attributable to the presence of Eu^{+3} in the phosphor, and that this may be the reason that such phosphors are obtained by combining cesium halide with a trivalent europium compound. Applicants do not exclude the possibility that the claimed phosphor can be prepared by methods other than those specifically described in Applicants' specification. Given the benefit of Applicants' teachings, perhaps one skilled in the art could even find a way to produce the claimed phosphor starting with a europium source other than a trivalent europium compound. However, such

speculations have nothing to do with the novelty of the phosphor of claim 21 over that provided by Pedrero et al.

The novelty and scope of the claim 21 phosphor should not be confused with the novelty and scope of Applicants' process claims. Certain of the latter do indeed encompass the use of divalent europium compounds, while distinguishing the teachings of Pedrero et al. by other recited process features that may or may not be relevant to claim 21. But the novelty and scope of the process claims do not limit the scope and novelty of the product claims. If a broadly defined class of compounds is novel and unobvious, the scope of coverage of such class is not limited by the fact that only a specific process might be capable of producing the compounds.

Thus, it is respectfully submitted that the rejection of claim 21 is based on a fundamentally erroneous premise, that the claim properly distinguishes over the teachings of Pedrero et al., and that the rejection should, therefore, be withdrawn.

H. 35 U.S.C. §103 Rejection

1. Rejection based on U.S. Patent Application No. 09/745,795

Applicants respectfully acknowledge, consistent with the above-noted Interview Summary, that the Examiner has withdrawn the rejection under 35 U.S.C. 103(a) based on U.S. Patent Application No. 09/745,795 (i.e., U.S. Publication No. 2001/0007352).⁴

2. Rejections based on U.S. Patent Nos. 6,479,835; 6,512,240; 6,528,812; 6,501,088; and, 6,495,850

Reconsideration is respectfully requested of the rejection of the following claims under 35 U.S.C. §103 as being obvious in view of the noted U.S. Patents:

- Claims 1-15 and 20-34 based on U.S. Patent Nos. 6,479,835; 6,512,240; 6,528,812 and 6,501,088.

⁴ With respect to this published application, it is to be noted that although it has been abandoned, a divisional of this application was filed on December 31, 2002 (Serial No. 10/331,764), which published on May 15, 2003 as Publication 2003/0091729.

- Claims 1-16 and 20-34 based on U.S. Patent No. 6,495,850.

The Office asserts that one or more of the cited references disclose or suggest "a binderless phosphor screen comprising a CsX:Eu phosphor, where X is Cl or Br produced by mixing CsX with 10^{-3} to 5 mol% of an europium compound selected from EuX'_2 , EuX'_3 and EuOX' , where X' is F, Cl, Br, or I; firing this mixture at a temperature above 450°C ; cooling and recovering the phosphor."⁵ It is also asserted that one or more of the cited references disclose or suggest that the phosphor has radiation stored therein. Further, the Office asserts that one or more of these references disclose or suggest the binderless phosphor screen can be produced by applying the phosphor produced by the above process to a substrate by a method selected from chemical vapor deposition or physical vapor deposition. The Office still further asserts that one or more of these references disclose or suggest the screen can also be produced by bringing multiple heatable containers of CsX and an europium compound selected from EuX'_2 , EuX'_3 and EuOX' , where X' is F, Cl, Br, or I, or alternatively a single container comprising a mixture of CsX and a noted europium compound, into a deposition chamber with a substrate and depositing the mixtures on a substrate by a method selected from chemical vapor deposition or physical vapor deposition. Accordingly, the Office asserts the processes claimed in the present invention are identical to the processes disclosed in one or more of the cited references, and that the phosphors disclose therein would inherently have the properties of the phosphor of claim 21.

In response thereto, and further in response to the Office's assertion that there is insufficient evidence in the present application to disqualify the cited references as prior art under 35 U.S.C. §§ 102(f) or (g) in any rejection under 35 U.S.C. §103(a), submitted with this Amendment C are Declarations under 37 U.S.C. §1.132 from inventors Martin Devenney, Casper Reaves, Paul Leblans and Lue Struye, wherein each declares that:

- (i) each is an inventor in the present application;
- (ii) each is a joint inventor of the subject matter claimed in cited U.S. Patent Nos. 6,479,835; 6,512,240; 6,528,812; 6,501,088 and 6,495,850; as well as non-cited U.S. Patent No. 6,504,169;

⁵ Quoting the present Office action at page 5 (see the first full paragraph related to this particular rejection).

- (iii) each is also a joint inventor in non-cited published U.S. Patent Application 2003/0104121; and,
- (iv) to the extent that any of these U.S. Patents or this published U.S. Patent Application, or cited U.S. Patent Application 2001/0007352, disclose the following, this disclosure constitutes a publication of their own work:
 - (a) a binderless phosphor screen comprising a CsX:Eu phosphor, wherein X is Cl or Br, produced by mixing CsX with 10^{-3} to 5 mol% of an europium compound selected from EuX'_2 , EuX'_3 and EuOX' , wherein X' is F, Cl, Br or I; firing this mixture at a temperature about 450°C ; cooling and recovering the phosphor;
 - (b) producing a binderless phosphor screen by applying the phosphor produced by the process of (a) to a substrate by a method selected from chemical vapor deposition or physical vapor deposition;
 - (c) producing a binderless phosphor screen by bringing heatable multiple containers of CsX and an europium compound selected from EuX'_2 , EuX'_3 and EuOX' , wherein X' is F, Cl, Br or I, or a single container comprising a mixture of CsX and an europium compound selected from EuX'_2 , EuX'_3 and EuOX' , wherein X' is F, Cl, Br or I, into a deposition chamber with a substrate and depositing the mixtures on the substrate by a method selected from chemical vapor deposition or physical vapor deposition;
 - (d) a phosphor characterized by the formula CsX:Eu, wherein X is selected from the group consisting of Br, Cl and combinations thereof, said phosphor exhibiting, when excited with radiation of 254 nm, a blue photoluminescence and a red photoluminescence wherein said blue photoluminescence has a power (Watt) at least 100 times higher than said red photoluminescence; and,
 - (e) a process of stimulating a binderless storage phosphor screen comprising a CsX:Eu phosphor, wherein X is Cl or Br, produced by

the process of (a), wherein the phosphor has radiation stored therein.

In view of the foregoing, Applicants respectfully submit that the subject matter of claims 1-16 and 20-34 is in fact their own invention, and is not the invention of another. Furthermore, the subject matter relied upon by the Office in the cited U.S. Patents and/or published U.S. Patent Application is the work of the inventors in the present application. As such, the cited references do not qualify as prior art under 35 U.S.C. §§102(f) or (g). Reconsideration of this rejection is therefore respectfully requested.⁶

I. Obviousness-type Double Patenting

Applicants acknowledge the rejection of claims 1-15 and 20-34 under the judicially created doctrine of obviousness-type double patent over the following:

- Claims 8-10 of U.S. Patent No. 6,479,835;
- Claims 5-7 and 10-12 of U.S. Patent No. 6,528,812;
- Claims 1, 3-5, 9 and 10 of U.S. Patent No. 6,512,240;
- Claims 1, 3 and 4 of U.S. Patent No. 6,501,088; and,
- Claims 1-3 of U.S. Patent No. 6,495,850.

In response thereto, Applicants respectfully submit that, pursuant to a review of the ownership of the above-cited U.S. Patents, it has been concluded that the ownership of these patents and the present application is the same, and was the same

⁶ In the interests of brevity, and in view of the noted Declarations being submitted with this Amendment C, Applicants did not separately address each issue raised by the Office in the context of the present 35 U.S.C. §103 rejections. However, Applicants do respectfully disagree with the Office's assertion that Applicants previously argued in Amendment B that the cited published application was not enabling (see page 8, line 3 of the present action). Applicants have not in any way addressed enablement in the context of the disclosure provided by this cited reference, either here or in Amendment B.

* at the time of the subject invention; that is, the subject matter at issue in this application is under an obligation to assign to the same party as that of the above-identified patents, as was under such an obligation at the time of the subject invention. The necessary title transfers have therefore been implemented and are being filed to reflect this conclusion. Additionally, enclosed with this Amendment C is a Terminal Disclaimer, submitted in accordance with 37 C.F.R. §1.130(b) and 37 C.F.R. §1.321(c).


In view of the foregoing, Applicants respectfully submit that the obviousness-type double patenting rejections have been obviated. Reconsideration of these rejections is therefore respectfully requested.

CONCLUSION

In view of the foregoing, favorable reconsideration and allowance of all pending claims is respectfully requested.

* Enclosed is a check for \$1,060.00, for a three (3) month extension of time and the required Terminal Disclaimer Fee. The Commissioner is hereby authorized to charge any underpayment or credit any overpayment to Deposit Account No. 19-1345.

Respectfully submitted,



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*Enclosures